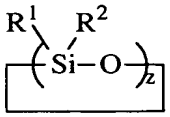
WHAT IS CLAIMED IS:

1. A process of making treated metal oxide nanoparticles, comprising mixing metal oxide nanoparticles, a solvent, and a surface treatment agent,

wherein the surface treatment agent has a structure represented by formula (I)

$$R—Z(X)_nY_{3-n} \quad (I)$$

wherein R and X each independently represents an alkyl group containing from about 1 carbon atom to about 30 carbon atoms, an aryl group containing from about 6 to about 60 carbon atoms, a substituted alkyl group containing from about 1 to about 30 carbon atoms or a substituted aryl group containing from about 6 to about 60 carbon atoms, an organic group containing of from about 1 to about 30 carbon atoms and a carbon-carbon double bond or a carbon-carbon triple bond, and epoxy-group,
Z represents a silicon atom, titanium atom, aluminum atom or zirconium atom, and
Y represents a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxy group, or an allyl group, and n is an integer of from 0 to 3, or wherein the surface treatment agent has a structure represented by formula (III)



(III)

wherein R^1 and R^2 each independently represents an alkyl group of from about 1 to about 30 carbon atoms, an aryl group of from about 6 to about 60 carbon atoms, and a substituted alkyl group or a substituted aryl group of from about 1 to about 30 carbon atoms, and z represents an integer of from about 3 to about 10.

2. The process according to claim 1, further comprising heating the mixture to a temperature of at least about 80°C for a period of at least about 1 hour.

3. The process according to claim 1, wherein the surface treatment agent is an arylsilane or arylsiloxane in which the aryl group contains from about 6 to about 60 carbon atoms.

4. The process according to claim 1, wherein the surface treatment agent is selected from the group consisting of methyltrimethoxysilane, ethyltrimethoxysilane, methyltriethoxysilane, propyltrimethoxysilane,

octyltrimethyoxysilane, trifluoropropyltrimethoxysilane, tridecafluoro-1,1,2,2-tetrahydrooctyltirmethoxysilane, p-tolyltrimethoxysilane, phenyltrimethoxysilane, phenylethyltrimethoxysilane, benzyltrimethoxysilane, diphenyldimethoxysilane, dimethyldimethoxysilane, bromophenylsilane, cyanophenylsilane, fluorophenylsilane, diphenyldisilanol, cyclohexylmethyldimethoxysilane, vinyltrimethoxysilane, 3-glycidoxyproplytrimethoxy-silane, 3-(trimethoxysilyl)propylmethacrylate, hexamethylcyclotrisiloxane, 2,4,6-trimethyl-2,4,6-triphenylcyclotrisiloxane, 2,4,6,8-tetramethyl-2,4,6,8-tetraphenylcyclotetrasiloxane, hexaphenylcyclotrisiloxane, octamethylcyclotetrasiloxane, octaphenylcyclotetrasiloxane, and 2,4,6,8-tetramethyl-2,4,6,8-tetravinylcyclotetrasiloxane.

5. The process according to claim 1, wherein the metal oxide nanoparticles are alumina nanoparticles.

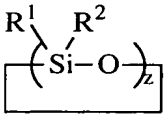
6. The process according to claim 1, wherein the metal oxide nanoparticles are selected from the group consisting of γ-alumina, δ-alumina, α-alumina and a mixture of γ-alumina with a different form of alumina, wherein the surface treatment agent is selected from the group consisting of phenyltrimethoxysilane, benzyltrimethoxysilane, p-tolyltrimethoxysilane, phenylethyltrimethoxysilane, diphenyldimethoxysilane, diphenyldisilanol, fluorophenyltrimethoxysilane, cyanophenyltrimethoxysilane, bromophenyltrimethoxysilane, phenyltrimethoxysilane, and mixtures thereof, and wherein the solvent is selected from the group consisting of hydrocarbons having a boiling point ranging from 80 to 250 °C and chlorinated hydrocarbons having a boiling point ranging from 80 to 250 °C.

7. A composition comprising a polymer binder having dispersed therein at least metal oxide nanoparticles that have surface attached thereto a surface treatment agent, wherein the surface treatment agent has a structure represented by formula (I)

$$R—Z(X)_nY_{3-n} \qquad (I)$$

wherein R and X each independently represents an alkyl group containing from about 1 carbon atom to about 30 carbon atoms, an aryl group containing from about 6 to about 60 carbon atoms, a substituted alkyl group containing from about 1 to about 30

carbon atoms or a substituted aryl group containing from about 6 to about 60 carbon atoms, an organic group containing of from about 1 to about 30 carbon atoms and a carbon-carbon double bond or a carbon-carbon triple bond, and epoxy-group, Z represents a silicon atom, titanium atom, aluminum atom or zirconium atom, and Y represents a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxy group, or an allyl group, and n is an integer of from 0 to 3, or wherein the surface treatment agent has a structure represented by formula (III)



(III)

wherein R^1 and R^2 each independently represents an alkyl group of from about 1 to about 30 carbon atoms, an aryl group of from about 6 to about 60 carbon atoms, and a substituted alkyl group or a substituted aryl group of from about 1 to about 30 carbon atoms, and z represents an integer of from about 3 to about 10.

8. The composition according to claim 7, wherein the polymer is selected from the group consisting of a polycarbonate, a polyester, a polyether, a polysulfone, a polyimide, a polyamide and a vinyl polymer.

9. The composition according to claim 7, wherein the metal oxide nanoparticles have an average size of from about 1 to about 250 nm.

10. The composition according to claim 7, wherein the surface treatment agent is selected from the group consisting of methyltrimethoxysilane, ethyltrimethoxysilane, methyltriethoxysilane, propyltrimethoxysilane, octyltrimethyoxysilane, trifluoropropyltrimethoxysilane, tridecafluoro-1,1,2,2-tetrahydrooctyltirmethoxysilane, p-tolyltrimethoxysilane, phenyltrimethoxysilane, phenylethyltrimethoxysilane, benzyltrimethoxysilane, diphenyldimethoxysilane, dimethyldimethoxysilane, diphenyldisilanol, cyclohexylmethyldimethoxysilane, vinyltrimethoxysilane, 3-glycidoxyproplytrimethoxy-silane, 3-(trimethoxysilyl)propylmethacrylate, hexamethylcyclotrisiloxane, 2,4,6-trimethyl-2,4,6-triphenylcyclotrisiloxane, 2,4,6,8-tetramethyl-2,4,6,8-tetraphenylcyclotetrasiloxane, hexaphenylcyclotrisiloxane, octamethylcyclotetrasiloxane, octaphenylcyclotetrasiloxane, and 2,4,6,8-tetramethyl-2,4,6,8-tetravinylcyclotetrasiloxane.

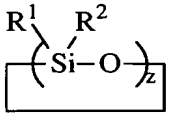
11. The composition in according to claim 7, wherein the composition includes from about 2% to about 80% by weight of the composition of the surface treated metal oxide nanoparticles.

12. A composition comprising a hydrophobic aromatic polymer binder having dispersed therein at least metal oxide nanoparticles that have surface attached thereto a surface treatment agent, wherein organic moieties of the surface treatment agent on the surface of the metal oxide nanoparticles have π-π interaction with aromatic components of the hydrophobic aromatic polymer.

13. The composition according to claim 12, wherein the surface treatment agent has a structure represented by formula (I)

$$R—Z(X)_nY_{3-n} \qquad (I)$$

wherein R and X each independently represents an alkyl group containing from about 1 carbon atom to about 30 carbon atoms, an aryl group containing from about 6 to about 60 carbon atoms, a substituted alkyl group containing from about 1 to about 30 carbon atoms or a substituted aryl group containing from about 6 to about 60 carbon atoms, an organic group containing of from about 1 to about 30 carbon atoms and a carbon-carbon double bond or a carbon-carbon triple bond, and epoxy-group,
Z represents a silicon atom, titanium atom, aluminum atom or zirconium atom, and
Y represents a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxy group, or an allyl group, and n is an integer of from 0 to 3, or the surface treatment agent has a structure represented by formula (III)



(III)

wherein R^1 and R^2 each independently represents an alkyl group of from about 1 to about 30 carbon atoms, an aryl group of from about 6 to about 60 carbon atoms, and a substituted alkyl group or a substituted aryl group of from about 1 to about 30 carbon atoms, and z represents an integer of from about 3 to about 10.

14. The composition according to claim 12, wherein the metal oxide nanoparticles have an average size of from about 1 to about 250 nm.

15. The composition according to claim 12, wherein the surface treatment agent is selected from the group consisting of methyltrimethoxysilane, ethyltrimethoxysilane, methyltriethoxysilane, propyltrimethoxysilane, octyltrimethyoxysilane, trifluoropropyltrimethoxysilane, tridecafluoro-1,1,2,2-tetrahydrooctyltirmethoxysilane, p-tolyltrimethoxysilane, phenyltrimethoxysilane, phenylethyltrimethoxysilane, benzyltrimethoxysilane, diphenyldimethoxysilane, dimethyldimethoxysilane, diphenyldisilanol, cyclohexylmethyldimethoxysilane, vinyltrimethoxysilane, 3-glycidoxyproplytrimethoxy-silane, 3-(trimethoxysilyl)propylmethacrylate, hexamethylcyclotrisiloxane, 2,4,6-trimethyl-2,4,6-triphenylcyclotrisiloxane, 2,4,6,8-tetramethyl-2,4,6,8-tetraphenylcyclotetrasiloxane, hexaphenylcyclotrisiloxane, octamethylcyclotetrasiloxane, octaphenylcyclotetrasiloxane, and 2,4,6,8-tetramethyl-2,4,6,8-tetravinylcyclotetrasiloxane.

16. The composition according to claim 12, wherein the metal oxide nanoparticles are selected from the group consisting of silicon oxide, aluminum oxide, titanium oxide, cerium oxide, chromium oxide, zirconium oxide, zinc oxide, tin oxide, iron oxide, magnesium oxide, manganese oxide, nickel oxide, copper oxide, indium tin oxide, and mixtures thereof.

17. The composition according to claim 12, wherein the metal oxide nanoparticles are alumina nanoparticles.

18. The composition according to claim 12, wherein the hydrophobic aromatic polymer is selected from the group consisting of an aromatic polycarbonate, an aromatic polyester, an aromatic polyether, an aromatic polysulfone, an aromatic polyimide, and a vinyl polymer containing aromatic groups, wherein the metal oxide nanoparticles are selected from the group consisting of γ-alumina, δ-alumina, α-alumina and a mixture of γ-alumina with a different form of alumina, wherein the nanoparticles have an average size of from about 1 nm to about 200 nm, and wherein the organic moieties are selected from the group consisting of phenyl, totyl, naphthyl, benzyl, fluorophenyl, bromophenyl, chlorophenyl, phenylethyl and cyanophenyl.

19. The composition according to claim 12, wherein the composition includes from about 2% to about 80% by weight of the treated metal oxide nanoparticles.

20. A photoreceptor including a charge transport layer comprised of the composition of claim 12 and having charge transport molecules therein.

21. A xerographic device including the photoreceptor of claim 20.